

# Abrupt "Delta-Like" Doping in Si and SiGe films by UHV-CVD

## ABSTRACT OF THE INVENTION

A structure and method of forming an abrupt doping profile is  
5 described incorporating a substrate, a first epitaxial layer of Ge  
less than the critical thickness having a P or As concentration  
greater than  $5 \times 10^{19}$  atoms/cc, and a second epitaxial layer having  
a change in concentration in its first 40Å from the first layer of  
greater than  $1 \times 10^{19}$  P atoms/cc. Alternatively, a layer of SiGe  
10 having a Ge content greater than 0.5 may be selectively amorphized  
and recrystallized with respect to other layers in a layered  
structure. The invention overcomes the problem of forming abrupt  
phosphorus profiles in Si and SiGe layers or films in semiconductor  
structures such as CMOS, MODFET's, and HBT's.